SKYLINE TOWER
FORT WAYNE, IN

Project Completion: 2018

Structural Engineer: Engineering Resources, Inc.

Architect: Design Collaborative

General Contractor: Weigand Construction

Steel Fabricator: Almet, Inc.

Wall Panelizer: FrameCo

Developers/Owners: Great Lakes Capital

170,000 square feet

CASE STUDY

ECOSPAN BRINGS SKYLINE'S BUDGET DOWN TO EARTH

Great Lakes Capital planned a 12-story apartment and retail building in Fort Wayne, Indiana but couldn't get the budget to work using traditional floor systems. Engineering Resources, Inc. introduced Nucor Vulcraft's Ecospan Structural Floor System to local contractor Weigand Construction, which used it to bring the project within budget. Ecospan's floor system trimmed four inches from each floor deck without impacting ceiling height, cutting 56,700 cubic feet of construction materials and 8,400 square feet of cladding from the tower, saving $260,000 on cladding alone.

BACKGROUND

Skyline Tower is a 12-story mixed use building, located in downtown Fort Wayne, Indiana. It contains 123 luxury apartment units with a total of more than 125,000 square feet of space. Its second floor is occupied by the regional headquarters of First Merchants Bank and its first floor devoted to retail, including a Ruth's Chris Steakhouse.

Notable details include a one-acre green roof and modern aesthetic blending metal panels, sheet metal, and wood.

> "We focused on meeting performance criteria to make the financing work and get everything within budget so the project could become reality. Ultimately, Ecospan made it happen.

Todd Kortus, PE, SE - Engineering Resources, Inc.

BUDGET WAS A PRIMARY CONCERN

Considering that the lot was quite small but more than 120 apartment units were needed to ensure long-term profitability, Great Lakes Capital had to build high, despite most buildings in the area being under four stories. The design-build team led by Weigand Construction had to run its numbers to assure the owner that the project was feasible. That meant that every bit of material that could be cut was a major win. In addition, the tower's proposed L-shape exterior increased the cost of the modern metal cladding more than would be typical on conventional rectangular buildings.

During calculations, it was decided to change the structural floor system to Vulcraft's Ecospan floor system. While it cost a small amount over the K-series installation it replaced, the Ecospan system knocked several inches off of the floor-to-floor height while maintaining identical livable space. This resulted in a total reduction of 48 inches of steel, concrete, piping, drywall, cables, and other materials that were no longer needed in a building with a footprint of over 14,000 feet—a total of 56,700 cubic feet of construction materials and wasted space eliminated. The biggest savings by far were the 8,400 square feet of metal panel cladding that was eliminated. Overall budget savings from the switch to the Ecospan system were $260,000 from cladding alone.

> Ultimately it came down to dollars and cents. We ran pricing exercises for conventional joists versus Ecospan with its savings on exterior cladding. Having lower floor-to-floor heights was where we found the real savings.

Todd Kortus, PE, SE
Engineering Resources, Inc.

Photo courtesy Engineering Resources, Inc.

KEY BENEFITS OF USING ECOSPAN

- Reduced floor-to-floor height means savings on building material costs
- No shoring required allows for easier trade access and faster construction
- Fewer load bearing walls offers more flexibility for future use of the interior space
- Fewer structural pieces required to distribute the loads across the CFS walls due to Ecospan's integrated Load Distribution Member (LDM)
- MEP can be run easily through interstitial space
- 1, 2 and 3 hour UL fire rated assemblies without sprinklers
- All parts, including closure plates, are supplied, making it easy for the contractor to get the floor in place

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All details were extensively coordinated so nothing went wrong. Everyone knew what Ecospan’s purpose was and it went in as advertised, no headaches. In my book that’s a win—that it was one of the things that faded into the background. Something we didn’t have to worry about.

Nathan Woods, Project Manager
Design Collaborative

Photo courtesy Engineering Resources, Inc.

NO SHORING MEANT EASIER, FASTER CONSTRUCTION

One major advantage Ecospan provided was that it was self-supporting. With no required shoring, the panelizer could start installation without having to work around shoring or wait for long curing times in the cold weather.

It also meant that trades such as electrical and plumbing could freely access all areas to get their work done as fast as possible, preventing scheduling delays.

WIDER JOIST SPACING SAVED TIME AND HASSLE

One of the major advantages of using Ecospan was that joint spacing could increase from 36 to 48 inches. This significantly decreased the number of joists that needed to be craned into place, which was a major time saver. Although the Ecospan joists could have been even shallower, a deeper version was chosen to enable MEP runs that made trades’ installation work much easier. Justin Vedder of Design Collaborative, the building’s architectural firm explained, “Going from three foot on center to four foot on center is a big benefit when you have a lot of building systems that have to run through the space—it goes up faster, a definite savings from how that system typically impacts construction speed.”

EXPANDING FUTURE DESIGN POSSIBILITIES WHILE CUTTING WEIGHT

Given that these were luxury apartments, it was likely that either tenants or the owners would want to adjust floor plans over time. This is extremely difficult in most buildings as many walls are load bearing and cannot be easily adjusted. Because Ecospan joists are typically laid from core to exterior wall, the majority of interior walls are not load bearing.

This means that in a building with Ecospan, owners can reprogram spaces-from small areas to entire floors—according to shifting market demands. For example, if in 15 years large luxury apartments are more in demand, demising walls can be shifted or removed to combine small units into larger ones. Another effect of swapping light panelized walls instead of heavy load bearing walls is it decreases the weight of the building, and can even reduce or eliminate some footings.

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The Vulcraft team was awesome. They took care of everything, and they took care of the SE. That was great on such a large project.

Justin Vedder, Project Architect - Design Collaborative

WHAT VULCRAFT DID

Vulcraft supplied Ecospan joists to be used in the upper residential floors of the tower. It also provided all of the standard joists, 2.0VLI floor deck, and roof deck for the entire building. In addition, the detailing department at Vulcraft helped with preliminary layouts during initial planning. Todd Kortus, PE, SE, an engineer at Engineering Resources said the Vulcraft team “was accessible and part of ongoing conversations regarding sizing, spans, budgeting, joist layout, etc. They helped throughout the design process. They provided costs for different floor systems to Weigand Construction, which worked with the owner to make educated decisions.”

WHAT WAS THE RESULT?

Ultimately, Ecospan was able to make the numbers on the project work by cutting 56,700 cubic feet of construction materials and 8,400 sq. ft. of cladding. At the same time, it allowed for light and reprogrammable non-load bearing steel stud walls, without needing shoring for the deck. With the budget savings gained, the owner and contractor felt secure in moving forward with the project, and in the end allowed Skyline Tower to come to life.

ASK AN EXPERT

For more details about Ecospan®, visit vulcraft.com. Details on engineering and sales contacts for your area can be found on the site.

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